May 11, 1937. E. J. CLEM 2,079,594

EXERCISING MACHINE

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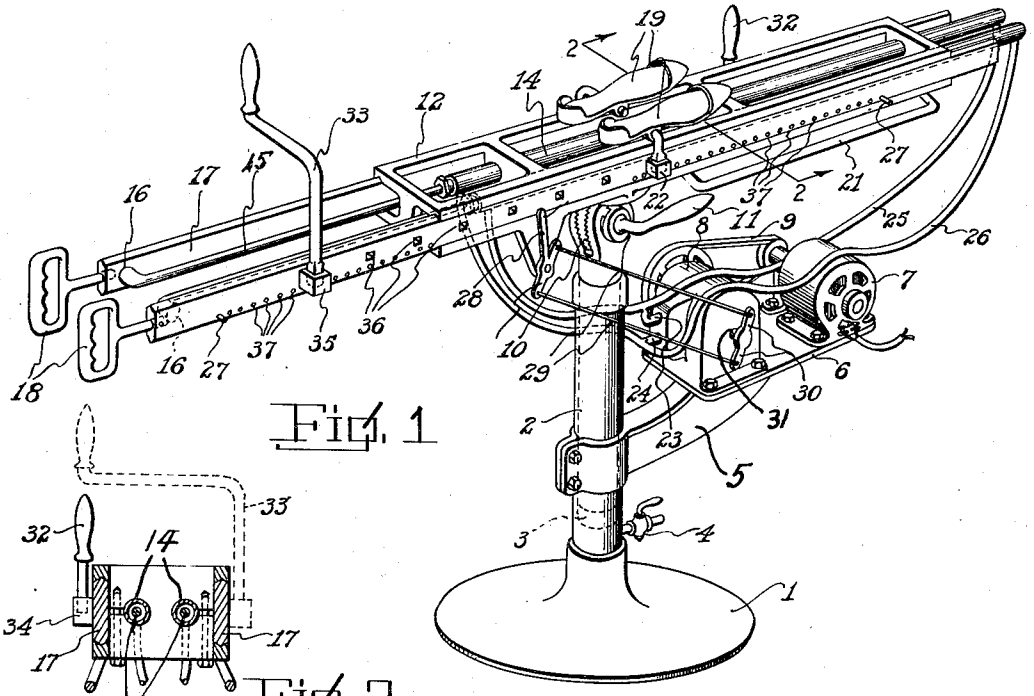


Fig. 1

Fig. 2

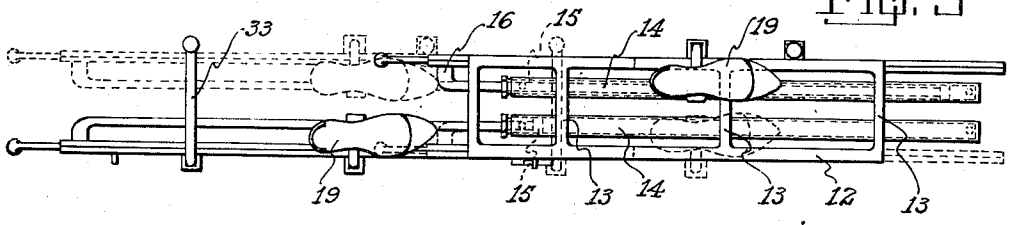


Fig. 3

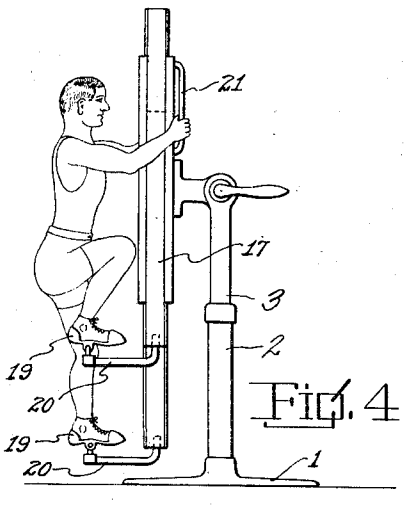


Fig. 4

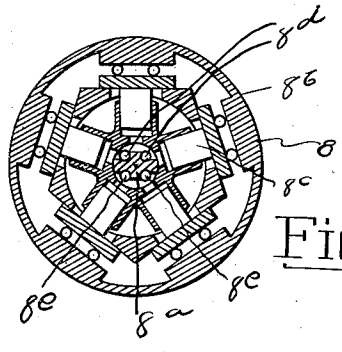


Fig. 5

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EXERCISING MACHINE

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6 Claims. (Cl. 128—25)

The invention relates to exercising machines, and has for its object to provide a device of this character having fluid cylinders controlling slidable members adapted to be grasped by the operator and means for alternately applying fluid pressure to opposite ends of adjacent cylinders for reversing the direction of movement of the slidable members thereby simultaneously applying force towards and away from the operator during the operation of the machine.

A further object is to pivotally mount the horizontal portion of the machine so that the horizontal portion may assume a vertical position, thereby allowing the machine to be used as a leg exerciser, similar to a walking or running operation.

A further object is to provide the slidable members with hand grip members out of registration with each other and adapted to be gripped and pulled in directions opposed to their direction of movement so that the arms will cross during the exercising operation for insuring a positive movement and exercising of the muscles of the upper portion of the body.

A further object is to provide a reversible fluid motor having pipe connections with opposite ends of the cylinders and valve control mechanism reversed at the ends of the strokes of the slidable members for allowing the motor to apply fluid pressure to the opposite ends of adjacent cylinders, thereby causing a continuous reciprocation of the slidable members.

With the above and other objects in view the invention resides in the combination and arrangement of parts hereinafter set forth, shown in the drawing, described and claimed, it being understood that changes in the precise embodiment of the invention may be made within the scope of what is claimed without departing from the spirit of the invention.

In the drawing:

Figure 1 is a perspective view of the exercising machine.

Figure 2 is a vertical transverse sectional view taken on line 2—2 of Figure 1, showing in dotted line position the forward handle for illustrating its relation to the handle on the other slide.

Figure 3 is a top plan view of the main carriage of the device.

Figure 4 is a side elevation of the exercising machine, showing the same adjusted to a vertical position for a leg exercising operation.

Figure 5 is a vertical transverse sectional view through a conventional form of variable oil delivery pump.

Referring to the drawing, the numeral 1 designates the base of the exercising machine, 2 the standard therefor, and which standard preferably has slidably mounted therein a piston 3 on the upper end of which the exercising device is mounted. The standard 2 has connected thereto an air supply pipe 4, whereby air, oil or any other fluid may be utilized for adjusting the exercising device to various elevations. In the following description, the device will be described as operated with a fluid, and it is to be understood that this fluid may be air, oil or any type of fluid.

Clamped to the standard 2 is an outwardly extending bracket 5, which bracket terminates in a motor and rotary pump supporting base 6, on which the motor 7 and the reversible fluid pump 8 is mounted. The pump 8 is driven by means of a belt 9 connecting the same to the motor.

Pivotally and adjustably mounted on the upper end of the piston 3 at 10 and held by an adjusting clamp 11 is the frame 12 of the exercising machine. It will be noted that the frame 12 may be not only adjusted to various horizontal elevations, but may be also adjusted and held at various inclinations, thereby allowing the adjustment of the device according to the height of the operator, or the device to be tilted to a vertical position as shown in Figure 4 for leg exercising purposes. It is to be understood that any number of exercising machines may be used and the source of fluid supply may be obtained from a single reversible motor for operating all of the machines. In the illustration the motor is shown as a unit of the device.

The frame 12 has rigidly mounted in the transverse partitions 13 thereof spaced cylinders 14 which are slidably mounted pistons 15 which extend beyond the forward end of the frame 12, and are connected at 16 to the forward ends of the slides 17, which are slidably mounted in opposite sides of the frame 12 as clearly shown in Figure 2. The forward ends of the slide members 17 are provided with removable hand grip members 18 which are adapted to be alternately reciprocated away from and towards the operator with a positive pull on the arms of the operator or a push against the operator, thereby providing a positive power movement in both directions during the reciprocation of the pistons 15 and the slides 17 carried thereby. When the device is used in a vertical position as shown in Figure 4 for a leg exercising operation the frame 12, with its slides 17, is tilted to a vertical position and foot receiving members 19 are applied thereto, preferably by mounting the same on brackets 20 which are placed in the slides 17 after the removal of

the handle members 18. When the device is used in this position the operator grasps the handle members 21 to steady himself during the leg exercising operation. It will be noted when in this position the operator simulates a walking operation and that the legs are flexed against a positive up and down movement during the entire operation. When a standing still walking operation is desired the foot receiving members 19 are used with the frame 12 horizontally disposed, and as the foot receiving members 19 are mounted in the brackets 22 on the sides of the slides 17, it will be noted that they will be reciprocated for moving the legs positively forwardly and rearwardly and the operator may use leg force in opposition to this line of force for stretching and exercising the leg muscles.

Fluid is alternately forced into opposite ends of the cylinders 14 for moving their pistons 15 in opposite directions as clearly shown in full and dotted lines in Figure 3. To accomplish this result, the reversible fluid motor 8 is provided with discharge pipes 23 and 24. The discharge pipes 23 and 24 merge into pipes 25 and 26. It will be noted that the pipes 25 and 26 have their ends connected to and discharging into opposite ends of the adjacent cylinders 14 so that the pistons within the adjacent cylinders 14 will be moved in opposite directions for moving the slides 17 in opposite directions, as shown in Figure 3. As one of the slides 17 approaches the ends of its movement, one of the pins 27 engages the pivoted rock lever 28 and rocks the same, thereby imparts pulls on one of the connecting members 29, which are in turn connected to the arms 30 of the reversing shaft 31 of the reversible fluid motor 8, thereby causing the direction of fluid to be changed and pressure to be alternately applied to opposite cylinder ends through discharge pipes 23 and 24 and pipes 25 and 26. The members 29 may be rods or flexible members or they may be stretchable members for allowing an upward adjustment of the exercising device.

For exercising the arms and chest muscles the slides 17 are provided with hand gripped members 32 and 33. The member 32 is removably mounted in a socket 34, while the member 33 is removably mounted in a socket 35, which is in turn adapted to be adjusted or placed in any of the apertures 36 for positioning the handles 32 and 33 in relation to each other. It will be noted that the handle 33 extends upwardly and transversely across the machine to a position where it would pass the handle 32 as the slides 17 reciprocate.

In exercising the arms and chest the operator grasps the handle members 32 and 33, and as the handles are reciprocated with the slides 17, the operator can tension the muscles against the reciprocating action or movement, thereby stretching all of the muscles and exercising the same. It will be noted that the handle members 33 can be adjusted so they will pass each other, thereby crossing the arms during the reciprocation of the slides. The reversing pins 27 may be adjusted to various positions in the apertures 37 of one of the slides 17 for reversing or regulating the amount of travel of the slides.

From the above it will be seen that an exercising machine is provided which may be adapted to all exercising conditions for exercising arm and leg muscles and other muscles of the body, and the device is simple in construction, fluid operated and if desired may be used in series getting its fluid pressure from a central plant if desired. This is particularly desirable in gymnasiums where a number of machines could be used side by side.

Although a reversible pump is shown for purposes of illustration, and a variable oil delivery pump, it is to be understood that any kind of pump, whether reversible or not may be used, and any number of pumps. In Figure 5, in which a variable delivery reversible pump is shown, in operation, when two shafts in the pump 8*a* are in line as shown in Figure 5, both driver and cylinder barrel 8*b* revolve together about the same center and the pistons 8*c* lie quiet in the cylinder pumping no oil. When the movable shaft is shifted off-center in relation to the fixed one, as shown, the pistons move in and out as the cylinder barrel and driver revolve; thus, if the movable shaft is only slightly off center a very short stroke results and very little oil is pumped by the pistons. As the shaft is moved further off-center, the stroke of the pistons is correspondingly increased and the quantity of oil pumped also increased. If the shaft is moved to the left, the oil is drawn in through the upper passages in the cylinder barrel shaft and designated by the character 8*d*, and is forced out through the lower passages 8*e*. If the shaft is shifted to the right the oil is drawn into the lower passages 8*e*, and out through the upper passages 8*d* of the shaft, thus, reversing the direction of the flow of oil in the pipes leading to and from the pump and from the other operating mechanism of the exercising device.

Although a particular type of reversible oil pump is described, applicant does not limit himself to any particular kind of pump.

The invention having been set forth what is claimed as new and useful is:

1. An exercising device comprising a base, an angularly adjustable frame carried by the base, slide bars mounted in said frame, means for reciprocating said slide bars in opposite directions, said means comprising a reversible fluid pump, cylinders carried by the frame, pistons within the cylinders, connections between the pistons and the slide bars, cross pipe connections between opposite ends of adjacent cylinders for moving the pistons in opposite directions, said cross pipe connections being connected to the reversible fluid pump and means carried by one of the slide bars for reversing the pump.

2. An exercising device comprising spaced reciprocating bars, a frame between said bars and in which said bars are slidably mounted, spaced cylinders carried by the frame between the reciprocating bars, pistons connected to ends of the reciprocating bars and extending into the cylinders, a fluid pump, cross connected pipe connections between the fluid pump and the cylinder ends and means actuated by the slidable bars for reversing the pump and the supply of fluid to the cross connecting pipes to the cylinders.

3. A device as set forth in claim 2 including a standard on which the frame is pivotally mounted.

4. A device as set forth in claim 2 including a stand on which the frame is pivotally mounted, a bracket carried by the stand and supporting the pump and flexible pipes forming the cross connecting means between the pump and the cylinders.

5. A device as set forth in claim 2 including a supporting standard to which the frame is pivotally connected, said pivotal connection between the frame and standard being formed so that the frame and slide bars carried thereby may assume a vertical position.

6. An exercising device comprising a supporting standard, a frame hingedly connected to the upper end of the standard, body engaging reciprocating bars slidably mounted in guide channels in the outer sides of the frame, spaced cylinders within the frame between the slide bars, pistons slidably mounted within the cylinders, said pistons extending beyond the ends of the cylinders and anchored to the slide bars at points spaced from the ends of the frame, means for alternately supplying fluid pressure to opposite ends of the cylinders for reciprocating the slide bars in opposite directions, and means controlled by one of the slide bars as its passes through its channel mount for reversing the direction of fluid flow to the ends of the spaced cylinders.

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